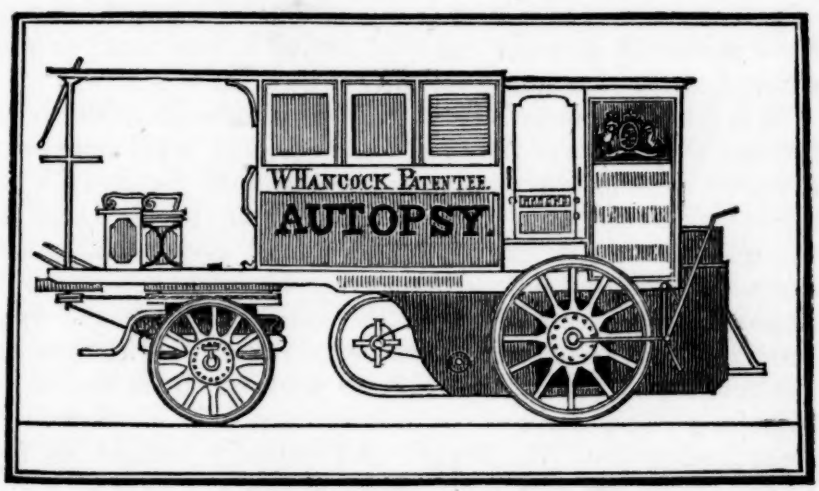
The Mechanic.

OCTOBER, 1834.

[For the Mechanic.]

STEAM-CARRIAGES, AND LOCOMOTIVE ENGINES.



Mr. Hancock's Steam-Carriage.

Since the efforts of Evans and Symington, a great number of experiments involving large fortunes have been made to introduce steam-power upon common roads; but until very recently they have been unattended with success. The attempt of Mr. Gurney, about ten years ago, inspired the friends of the project with the most sanguine expectations, which were not, however, suffered to be realized. From that time to the present, a number of powerful and talented competitors have been in the field, determined to accomplish their end, if ingenuity could surmount, or perseverance overcome the difficulties. The trials have been prin-

cipally confined to Great Britain, and those entitled to particular notice have been made in London or the vicinity; of the latter, the exertions of Mr. Walter Hancock have been more successful than those of any of his predecessors or cotemporaries; having established and kept in operation a number of hourly steam-coaches to ply between different parts of the metropolis.

In the introduction of steam-power upon common roads, there have existed difficulties and objections which no ordinary powers of mind could easily remove; the inequality of roads in general, is so great, as to subject the machinery to serious injury from the jarring and racking of the engine; the frightening of horses travelling upon the same road, and the weight of the carriage, being increased several tons by the engine, causing a much more rapid wear of the roads, together with the disagreeable effects of smoke, steam, and heat in the streets of a populous city, have made the general introduction of steam-coaches considered more of a nuisance than a benefit.

It is true that these are objections of considerable force, but are they or have they been remediless? level roads sufficiently smooth for steam-coaches, should be considered necessary to the ease and welfare of the horse; and although the weight transported is much greater in consequence of the engine, yet, by having broad wheels, it would almost be sufficient to repair the injuries which the road received from other narrow wheeled vehicles. In regard to the smoke, by the use of coke as fuel, but little would be generated, and if there were, it can not only be prevented from issuing into the streets, but actually burned as fuel in the formation of steam. Most, if not all these improvements have been embodied in Mr. Hancock's 'Autopsy,' the engraving of which at the head of our article, will give a general idea of the construction of all the carriages he has put in operation. The editor of the London Mechanics' Magazine says that he has witnessed the performances of the 'Autopsy' repeatedly, both as a passenger and looker-on, and can only re-echo the general opinion, that it works admirably. The machinery has been recently improved by an efficient and ingenious method of changing the fire-bars when they become incrusted with clinkers, which prevent the passage of the air, and diminish the speed of the engine. Of the profits of the project, some idea may be formed from the following statement:—The

quantity of coke expended in each journey of about two miles scarcely exceeds a bushel, so that even supposing the wear and tear of the engine to be as great as in the case of Stephenson, on the Liverpool and Manchester Railway, or even twice or thrice as great, the returns from such a carriage running between places two or three miles distant, must be sufficiently ample to afford a very handsome profit, and, according to a calculation made at the time by a passenger, there would be a clear gain of nearly cent per cent.*

That the substitution of steam instead of animal power would be a great desideratum, we cannot for a moment question, especially when we consider, that by a moderate calculation, the produce of one and a half acres in pasturage, hay, &c. is necessary for the support of a single horse, whereas one acre is said to be sufficient for the support of a whole family; which, in point of political economy, places the introduction of steam travelling as an object of momentous interest.

Although we are pleased with the attempts, and would wish the projectors all the success which they anticipate, yet we must confess that we have confidence in but one method of steam travelling, and that is upon railways. On these smooth and level planes, the engine glides along followed by a train of cars containing several hundred tons, without the least obstruction or inconvenience, neither frightening horses nor incommoding travellers. Such a method of travelling is safe, economical, and by far more rapid than any other which has ever been practised, forty miles an hour having been accomplished by one of Mr. Stephenson's engines on the Liverpool and Manchester Railroad, being a speed of which we can scarcely have a conception. In 'Stuart's History of the Steam-Engine,' we find the following particulars relating to locomotive† engines upon railways. Trevethick and Vivian's high-pressure locomotive engine, with a cylinder of eight inches diameter, and a pressure of 65 pounds per square inch, (apparently about eight horse power,) drew carriages containing ten and a half tons of iron, at five and a half miles per hour for a distance of nine miles. Although it is not stated, yet we may reasonably suppose, that this trial was made upon a railway about 1804-5. Mr. Blenkinsop next appears to have taken out a patent for a locomotive engine, the powers of which he thus describes in reply to queries

* Cost of a Steam Coach, about $3,000. † Self-Moving.

put by Sir John Sinclair. His engine has two eight-inch cylinders, weighs five tons, consumes seventy pounds of coal and fifty gallons of water per hour, and draws twenty-seven wagons, weighing ninety-four tons, on a level railway; at three and a half miles an hour, or fifteen tons upon an ascent of two inches in the yard; when lightly loaded, travels ten miles an hour, does the work of sixteen horses in twelve hours, and costs £400. Mr. Blenkinsop had cogs on the wheels of his engine, and also on the ascending part of the railway, by which he intended to overcome greater inclinations of the road; but it has been found more advantageous to have a *level* road, although the first expense should be double.

It would be useless as well as difficult to describe all the attempts both successful and abortive, which have been made from the time of Trevethick and Vivian, to the grand trial on the Liverpool and Manchester Railway, of which the following account will not be without interest. At the first projection of the Liverpool and Manchester Railroad, some doubts were expressed as to the kind of power to be employed for locomotion—whether horses, or locomotive engines, or fixed engines, drawing a load by means of ropes from one station to another. Mature consideration, and the experience obtained from other undertakings, satisfied the directors that the employment of horses was entirely out of the question. At length it was determined, in April, 1829, to offer a premium of £500 for the most improved locomotive engine, subject to certain conditions. The trial of the different engines offered to contend for the above reward, took place on the 6th of October, 1829, on a level portion of the railway at Rainhill. Four steam-carriages were entered on the lists; but the principal interest was attracted by the 'Novelty,' an engine just patented by Messrs. Braithwaite and Erickson, and great hopes were entertained of its successful competition, but an accident which happened to the boiler prevented the engine from going the entire distance. The distance appointed to be run was seventy miles, and the engine, when fairly started, was to travel on the road at a speed of not less than ten miles an hour, drawing after it a gross weight of three tons for every ton of its own weight. This distance was to be accomplished by moving forwards and backwards on a level plane of one mile and three quarters in length, by which arrangement, the machine had to pass over the

place forty times, and make as many stoppages. The 'Rocket,' weighing four tons five hundred weight, performed the distance in less than six hours and a half, including stoppages; the speed was frequently eighteen miles an hour, and occasionally upwards of twenty. In this trial, half a ton of coke was consumed as fuel; coke being used instead of coal to prevent the annoyance of smoke. This engine was the only one which performed the stipulated task, and the premium was accordingly awarded to Mr. Booth and the Messrs. Stephenson, whose engines are now principally used on the Manchester and Liverpool railroad. There are several also on the plan of the 'Novelty,' which, from their lightness and speed, have given great satisfaction. We have understood that the company have procured an engine on this principle, to be run on the Boston and Lowell railway. The Boston and Worcester Rail-Road Company have one or two of the 'Rocket' engines, which we believe work well.

It may be asked why we have confined ourselves so particularly to the operations in England—whether nothing has been done in our own country worthy of being mentioned? our answer is, that with the exception of one or two attempts, of which that of Mr. Sullivan, an eminent engineer, stands conspicuous, but little has been done. We must recollect, however, the very recent introduction of railways or locomotive carriages in this country, and consequently, the want of the *object* to call the attention, or rouse the energies of our ingenious men. But the extensive lines of railroad now constructed, and being projected in various parts of the Union, will open a channel for the display of that love of improvement for which our countrymen have been so celebrated, and afford an opportunity which we are confident will not be neglected.

[From the Journal of the Franklin Institute.]

PROPOSED REGULATIONS FOR VESSELS PROPELLED BY STEAM.

THE following bill was reported by the committee on naval affairs of the Senate of the United States, on the 12th of June last, not with a view to its being acted upon during the late session, which was then drawing to a close,

but preparatory to a more enlightened procedure hereafter, and, with this view, we now publish it, and hope that the journals of the day may make it extensively known, and thus afford an opportunity to those who are informed upon the subject, to suggest such ideas as may tend to render the act, when passed, as perfect as possible. Any communications having this object in view, addressed to the Editor, or to the Actuary of the Franklin Institute, will be laid before the committee of Congress, at the next session, in such a way as shall appear most likely to render them useful.

In giving this notice, the Editor would remark that it is not intended to invite the communication of any specific plan for preventing explosions, however valuable it may be in the eyes of its inventor, or in itself; such plans may be spread out upon the pages of the Journal, but the legislation of Congress upon the subject must be of a general character, enforcing the adoption of those precautionary means which are applicable to engines of every description. It will be time enough to adopt the plan of an individual, after he shall have carried it into operation to such an extent that the evidence of continued use in numerous and trying cases, shall have left no doubt of its efficiency, an event not likely to be one of early occurrence.

EDITOR.

A BILL

For the Regulations of Vessels propelled in the whole, or in part, by Steam.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be the duty of all owners of steam-boats, or vessels propelled in the whole, or in part by steam, on or before the first day of October, one thousand eight hundred and thirty-four, to make a new enrolment of the same under the existing laws of the United States, and to take out from the collector or surveyor of the port, as the case may be, where such steam-boat, or vessel, is enrolled, a new license, under such conditions as are now imposed by law, and as shall be imposed by this act.

Sec. 2. And be it further enacted, That it shall not be lawful for the owner, master, or captain, of any steam-boat, or vessel, propelled in the whole, or in part, by steam, to transport any goods, wares, and merchandise, or passengers, in, or upon the bays, lakes, rivers, or other navigable waters

of the United States, from and after the said first day of October, one thousand eight hundred and thirty-four, without having first obtained from the proper officer, a license under the existing laws, and without having complied with the conditions imposed by this act; and for each and every violation of this section, the owner, or owners, of said steam-boat, or vessel, shall forfeit and pay to the United States, the sum of .

Sec. 3. And be it further enacted, That it shall be the duty of the President to appoint, at such ports on the navigable waters, bays, lakes, and rivers, of the United States, as in his judgment will be most convenient to the owners and masters of steam-boats and vessels propelled in the whole, or in part, by steam, one or more persons of competent skill, to make inspections of such boats and vessels, and of the boilers and machinery employed in the same, whose duty it shall be to make such inspections when called upon for that purpose, and to give to the owner or master of such boat or vessel duplicate certificates of all such inspections, and the said person, so appointed, shall, before entering upon the duties of said appointment, take an oath, before some competent authority, faithfully to perform and discharge the same.

Sec. 4. And be it further enacted, That the person who shall be called upon to inspect the hull of any steam-boat, or vessel, under the provisions of this act, shall, after a careful and thorough examination of the same, give to the owner, or master, as the case may be, a certificate, in which shall be stated the age of said boat, or vessel, when and where originally built, and the length of time the same has been running, and his opinion whether the said boat, or vessel, be sound, and fit to be employed for the transportation of passengers or freight; for which service, so performed, on every such boat, or vessel, the said inspector shall be allowed and paid by the owner or master thereof, and before the delivery of said certificate, the sum of dollars, for every boat, or vessel, of less than one hundred tons, and the sum of dollars for every boat, or vessel, of one hundred tons and upwards.

Sec. 5. And be it further enacted, That it shall be the duty of the person who shall be called upon to inspect the boilers and machinery of any steam-boat, or vessel, in conformity to the provisions of the third section of this act, carefully, fully, and thoroughly, to inspect and examine the

engine and machinery of said boat, or vessel, and to state his opinion of its soundness; and he shall moreover provide himself with a suitable hydraulic pump, and, after examining into the state and condition of the boiler, or boilers, of such boat, or vessel, it shall be his duty to test the strength and soundness of said boiler, or boilers, by applying to the same a hydraulic pressure equal to three times the pressure which the boilers are allowed to carry in steam; and if he shall be of opinion, after such examination and test, that the said machinery and boilers are sound and fit for use, he shall deliver to the owner, or master of such vessel, or boat, duplicate certificates to that effect, stating therein the age of the said boilers, and the weight or proportion of steam which may with safety be carried by said boilers, and which shall in no case exceed one-third part of the weight, or pressure, which said boilers may bear without danger of explosion or injury, one of which certificates it shall be the duty of the said master, or owner, to deliver to the collector, or surveyor of the port, wherever he shall apply for license, or for renewal of license; the other he shall cause to be posted up and kept in some conspicuous part of said boat, or vessel, for the information of the public; and for each and every inspection of the said machinery, and inspection and test of the said boiler, or boilers, the said inspector shall be allowed and paid by the owner, or master, thereof, and before the delivery of the said certificates, the sum of dollars.

Sec. 6. And be it further enacted, That it shall be the duty of the owners, or masters, of said boats, or vessels, to cause the inspection provided for by the fourth section of this act to be made at least once in every twelve months; and the examination of the machinery, and the examination and test of the boilers, as provided in the fifth section hereof, to be made at least once in every three months; and to deliver to the collector or surveyor of the port where such boat, or vessel, has been enrolled or licensed, the certificate of such inspection; and on failure thereof, he, or they, shall forfeit the license granted to such boat, or vessel, and be subject to the same penalty as though he had run the said boat, or vessel, without having obtained such license.

Sec. 7. And be it further enacted, That whenever the master of any boat, or vessel, or the person, or persons, charged with the navigating said boat, or vessel, which is

propelled in the whole, or in part, by steam, shall stop the motion, or headway, of said boat, or vessel; or when the said boat, or vessel, shall be stopped for the purpose of discharging, or taking in cargo, or passengers, or when 'wooding,' and the steam in the boiler, or boilers, of such boat, or vessel, shall be equal to one-third part of the ascertained strength of said boiler, or boilers; he, or they, shall keep the engine of said boat, or vessel, in motion sufficient to work the pump, give the necessary supply of water, and to keep the steam down in said boiler, or boilers, to what it is when the said boat, or vessel, is under headway, at the same time lessening the weight on the safety valve, so that it shall give way when the steam in said boiler, or boilers, is equal to of its then ascertained strength, under the penalty of dollars for each and every offence in neglecting or violating the requirements of this section.

Sec. 8. And be it further enacted, That it shall be the duty of every master, or pilot, of a steam-boat, or vessel, except those navigating tide water, when descending any river, or stream in the night, when a descending boat shall come within one half mile of an ascending steam-boat, to shut off the steam, and ring the bell, and permit his boat to float upon the current of the river until the ascending boat shall have passed; and the master and owner of the ascending boat shall then assume the responsibility of steering clear of the descending boat, and be liable in damages to the extent of the injury which may be sustained.

Sec. 9. And be it further enacted, That it shall be the duty of the master and owner of every steam-boat, or vessel, running in the night, to suspend three lights at least three feet above the deck of said vessel, or boat; one at the bow, another at the stern, and the third at or near the middle of said boat, or vessel, under the penalty of dollars for each and every neglect thereof.

Sec. 10. And be it further enacted, That it shall be the duty of the owner and master of every steam-boat, or vessel, engaged in the transportation of freight, or passengers, to provide, and to carry with the said boat, or vessel, upon each and every voyage, or trip, one long boat, or yawl, for each tons of said boat, or vessel, which long boat, or yawl, shall be competent to carry at least twelve persons; and for every failure to provide and carry said boats, or yawls, in the proportion aforesaid, the said master and

owner shall forfeit and pay dollars: and it shall also be the duty of said master and owner to provide, as a part of the necessary furniture of said boat or vessel, a suction hose, and fire-engine and hose, suitable to be worked in said boat in case of fire, and to carry the same in each and every trip and voyage, in good order; and for each and every failure to provide and carry the same as hereinbefore required, said master and owner shall forfeit and pay the sum of dollars.

Sec. 11. And be it further enacted, That any owner or master of any steam-boat, or vessel, who shall fail to obtain the certificates of examination hereinbefore provided for in the fourth and fifth sections of this act, shall be barred from the recovery of any claim for freight or insurance that may accrue when without said certificate; and should any loss or damage to property in such case occur, in consequence of the unsoundness or unfitness for the transportation of freight or passengers of said boat, or vessel, or in consequence of the breaking or bursting of any part of the machinery or boilers, the owner shall be responsible to the full amount of said loss or damage.

Sec. 12. And be it further enacted, That the captain, or master, of any boat, or vessel, propelled in the whole, or in part, by steam, that may not have been examined, and obtained the certificates required by the fifth section of this act, shall, in the event of any loss or damage to property, or injury to persons, occasioned by the breaking of any part of the machinery, or the bursting of the boiler, or boilers, be subject to a fine not less than nor more than dollars, and an imprisonment of not less than , nor more than ; and that, in the event of loss of life being the result of such accident, then said captain, or master, shall be adjudged guilty of man-slaughter.

Sec. 13. And be it further enacted, That for any accident which may occur from racing, from carrying higher steam than the quantity authorized by the certificate, from running foul of, or into, another boat, from overloading the boat, or from any other cause which it is possible to foresee and avoid, or which may occur from any cause whilst the captain, master, pilot, or engineer, shall be engaged in gambling, or attending to any game of chance or hazard, the owner of such steam-boat, or vessel, shall be subject to the penalties provided for in the eleventh section of this

act; and the captain, master, pilot, or engineer, shall be respectively subject to the penalties provided in the twelfth section hereof.

Sec. 14. And be it further enacted, That when gunpowder is shipped on board of any vessel, or boat, propelled in the whole, or in part, by steam, which shall at all times be stowed away at as great a distance as possible from the furnace, a written notification of the fact shall be placed in three conspicuous parts of the boat, or vessel; and in the event of such notification not being so exhibited, then for any loss of property, or life, of which the powder may be deemed the cause, the owner shall be liable to the penalties provided in the eleventh section of this act; and the captain, or master, to the penalties provided in the twelfth.

Sec. 15. And be it further enacted, That any person, or persons, who shall ship, or put on board, or cause to be shipped, or put on board, of any steam-boat, or vessel, any gunpowder, without giving notice thereof, at the time of making the shipment, to the master or clerk, of said boat, or vessel, shall be liable to the penalty of dollars, which may be sued for and recovered before any court of competent jurisdiction, by the owner, captain, or clerk, of said vessel, or boat, for his, or her own use and benefit; and in case of any loss of property in consequence of gunpowder being on board of said vessel, or boat, the shipper that shall have failed to give due notice as hereinbefore required, shall be liable for all losses of property, or damage done thereto, or for any injury done to any person, or to their families; and in case of the loss of the life of any individual on board in consequence of gunpowder being on board, the person or persons, who shall have shipped the same without giving due notice thereof, shall on conviction thereof, be adjudged guilty of manslaughter, and punished accordingly.

Sec. 16. And be it further enacted, That it shall be the duty of the person who shall be called upon to inspect the boilers and machinery of any steam-boat, or vessel, under the third and fifth sections of this act, to examine the engineer of said boat, or vessel, for the purpose of ascertaining whether he or they be sufficiently qualified for the duties of his or their stations, and to propound interrogatories which the Secretary of the Treasury shall cause to be prepared and transmitted to the said inspector, which said interrogatories, being satisfactorily answered by the engineer,

or engineers, and certificates also being produced of his, or their regular habits, said inspector shall issue duplicate certificates, or diplomas, one to the engineer, or engineers, of said boat, or vessel, and the other to the captain or owner thereof, which said certificates shall be renewed annually; and the certificate granted to the captain, or owner, of said boat, or vessel, shall be exhibited to the collector or surveyor of the port, whenever he shall apply for a license, or a renewal of license; and the inspector shall be allowed and paid by the , for every such examination, the sum of dollars.

Sec. 17. And be it further enacted, That for any false certificate, or one given without the thorough examination contemplated by this act, the person who may be appointed to make the examination of the hull of any steam-boat, or vessel, or of the machinery thereof, or of the boilers therein, or of the competency and habits of the engineer, or engineers, of said boat, or vessel, shall be dismissed from office, and fined not less than nor more than dollars, and imprisoned not less than nor more than .

Sec. 18. And be it further enacted, That all penalties, fines, and forfeitures, imposed by this act, may be sued for, and recovered in any court of the United States of competent jurisdiction, within the district, or circuit, where the same may have been incurred, in the name of the United States—one half to the use of the informer, and the other half to the use and benefit of the United States.

[For the Mechanic.]

MY NOTE BOOK.—NO. VII.

We are told, that if charcoal be perfectly ignited before it is brought into a close room, that it is then perfectly harmless; but such is not the fact. Charcoal is composed of an oxide of carbon and hydrogen, and when in an ignited state, the hydrogen burns, and the carbon mixes with the oxygen of the atmosphere, and rises in the form of carbonic acid gas, one of the most pernicious of the gases. It is constantly forming while the charcoal continues to burn, and consequently it will be seen how dangerous it is to have charcoal burning in any room without a fire-place,

or other means of ventilation. Dashing cold water over the person, is the best method of recovering them from the effects of this gas.

There are many substances, particularly in chemistry, in the nature of which we are apt to be deceived, from the name: for instance, the green salt we have known by the name of copperas contains not a particle of copper, but is simply iron dissolved in sulphuric acid, and properly called sulphate of iron. Plumbago, or black lead, is an entirely different substance from what its name would imply, lead, in no form whatever, entering into its composition, it being merely a union of charcoal and iron, forming carburet of iron. The origin of the name probably arose from the color, which resembles the external appearance of lead.

Charcoal from its affinity with oxygen, will decompose the sulphuric and nitric acids, the latter with great rapidity. If the charcoal be dry and finely powdered, and the acid strong, and suffered to run down the inner side of the vessel to mix with the charcoal, it will burn rapidly, giving out a beautiful flame, and throwing up the powder so as to resemble a brilliant firework.

The beams of the theatre, at Herculaneum, were converted into charcoal by the eruption of Vesuvius, seventeen hundred years ago. After being buried under the lava for this length of time, the charcoal beams were found in as good a state as if it had been formed but yesterday. The incorruptibility of charcoal was known in the most ancient times, the famous temple of Ephesus having been built upon wooden piles, which had been charred on the outside to preserve them.

Diamonds are pure carbon, which is the base of charcoal, in a crystalized state. They are usually found in an ochreous yellow earth, under rocks of grit stone; they are also found detached, in torrents, which have carried them from their beds. Diamonds have no brilliancy when dug out of the earth, but are covered with an earthy crust, which is removed, and they are then polished with diamond dust, the only material sufficiently hard for the purpose. The sovereigns of India reserve the largest, that the price of the article may not fall; but in Borneo, notwithstanding all the precautions, the workmen frequently convey them away by swallowing them.

In England, the usual method of calculating the value of diamonds is by squaring the number of carats, and then

multiplying the amount by the price of a single carat;* thus, suppose one carat to be worth 2 dollars, a diamond of eight carats is worth 128 dollars, being $8 \times 8 \times 2$. Polished diamonds, without blemish, are worth 20 or 30 dollars per carat. In the year 1772, the Empress of Russia purchased a diamond that weighed 779 carats, nearly $6\frac{1}{2}$ ounces troy. She paid the immense sum of twelve tons of gold for it, and granted a pension of four thousand roubles† per annum to the vender.

Jet occurs in Scotland, in Yorkshire, Bavaria, and in France, near the Pyrenees. At the latter place, more than a thousand persons, it is said, are constantly employed in fabricating it into ornaments of dress, drinking vessels, rosaries, &c. It is composed of 76 parts charcoal, 22 of bitumen, and 2 of earth.

There are four distinct species of coal, the *graphite*, or black lead; *anthracite*, such as the Peach Mountain and Schuylkill; *jet*, or pitch coal, and the *common coal*.

An experiment was tried by Van Helmont, to discover the quantity of nourishment that a plant received from the earth, and from water. He planted a willow weighing 50 pounds in a certain quantity of soil, covering it carefully with sheet lead; it was kept in this state for five years, and watered with distilled water. At the end of that time the tree weighed 169 pounds three ounces; the earth in which it had vegetated was also weighed, and found to have lost only three ounces. The willow had, therefore, increased 119 pounds by the decomposition of water, and three ounces by the decomposition of earth.

Carbonic acid has the property of rendering lime soluble in water; as this acid escapes by exposure to the air, the calcareous matter or marble, is precipitated from the water which held it in solution. These are what are called *petrifying* waters, and were formerly reckoned among the number of miracles. At Guancavelica, in Peru, artists obtain statues, and even stones for building, by filling moulds frequently with a mineral water of this kind in that district.

The well known soda water is made by procuring the carbonic acid gas from pulverised marble, (which is lime and carbonic acid) by pouring sulphuric acid upon it. The

* A carat is a weight of four grains. † A rouble is about sixteen cents.

gas thus formed is forced with a forcing pump into the vessel containing water, which absorbs considerable of the gas, but under the pressure given by the pump, a gallon of water is combined with two and a half gallons of gas.

Boston, October 10th, 1834. JUNIUS.

[From the Journal of the Franklin Institute.]

PATENTS.

PATENT *for constructing Cisterns for holding Water, &c.;* Nathaniel Fortin and William Van Vleck, Sullivan, Madison county, New York, March 1.

What is called a *pattern curve,* which is like a tub without a bottom, is to be formed of the size of the intended reservoir; an excavation large enough to receive this pattern curve, and to allow of a due thickness for the intended wall, is then made, and the bottom of it covered with gravel, stones, &c. mixed with hydraulic lime. Upon this the curve is placed, and the space between it and the earth, is filled with like materials, and when dry, the staves, &c. which formed the curve, are to be removed. The claim is to, 'first, the pattern curve, around which to construct the cistern, reservoir, or wall; and secondly, compounding the hydraulic cement with substances of any kind, and thus forming a permanent wall by means of the pattern curve.'

We refer to the patent of G. Tibbetts, for our notice of a very similar contrivance, so similar, that so far as principles are concerned, we should denominate them identical. Patentees, however, are rarely aware that alterations in form or proportions, which still leave a thing essentially the same in its mode of action, are not protected by the patent law, such alterations being mere colorable pretexts, which, were they not resisted, would destroy its whole intention.

PATENT *for a mode of Ventilating Vessels;* Russel Jarvis, Boston, Massachusetts, March 5.

We are informed that 'this invention or improvement consists in expelling or drawing foul air, humidity, and

every kind of noxious vapor, from the vessel, and introducing, or injecting, at the same time, fresh air into the same vessel, without introducing water, &c. &c. The means proposed is the employment of condensing and exhausting pumps, to draw the foul air from the vessel, and introduce that which is fresh. It is proposed to place tubes leading down the masts into the hold, the masts being grooved to receive them, to prevent their interfering with its rotundity. Nothing peculiar is claimed in the construction of the pumps, or in the kind of machinery by which they are to be worked, the plans given being considered as mere exemplifications of the general principle.

The patentee expressly says, 'I do not claim as a new invention, the pumps above mentioned, nor the engine above described. What I claim as new, and as my own invention, is the application of pipes, pumps, and wheel work, or other moving power, as above described; or of pipes alone, fixtures in the vessel, as above described, to the ventilation of every kind of vessels.'

He does not appear to be aware of what has already been done and published, upon the subject, or he would have known that his claim was essentially defective. As to that part in which he proposes merely to fix tubes through which foul air may escape, and others through which fresh air may enter, we view it as so entirely inadequate, and so inferior to the ordinary wind sails, that we shall not attempt to discuss its merits. With respect to the pumps for blowing and exhausting, we might refer to many other sources of information, but under the article VENTILATION, in Rees' Cyclopedia, enough will be found to convince any one that what was done upon the subject by Dr. Hales, as far back as the year 1741, would throw the present plan into the shade. There the whole arrangement is clearly and distinctly shown, whilst the specification before us leaves the thing claimed uncertain and obscure, in most of its points, and would enable the patentee, should he see one of Dr. Hales' ventilators at work, to say, 'that is an invasion of my right.'

PATENT *for a mode of Preventing the Forgery of Checks;* John D. Pope, Baltimore, Maryland, March 8.

This is one of those schemes which will never go into operation, as there are to be scales of check numbers for

the use of each individual, and also to be lodged in the bank, for the purpose of indicating the number of checks which have been issued. To designate their amount, sets of steel types are to be made, with cutting edges, and with these, by means of a proper press, the numbers are to be cut out from the paper. In this plan there is no novelty; a proposition to patent it was made some years since, and discouraged by the Editor, as one of those schemes which would not pay the cost.

PATENT *for a Machine for Cutting and Trimming the Edges of Books and Paper;* Joseph Bateman, Harvard, Worcester county, Massachusetts, March 11.

The machine here patented is clearly described in the specification, well represented in the drawing, and has the merit of differing essentially from those previously patented for the same object. The body of the machine consists of three parallel bars, which may be eight feet long, and six inches square, placed horizontally, one above the other, and supported at suitable distances apart by end cheeks, bolts, &c. The lower bar forms the bed upon which the paper to be cut is placed; the middle bar is the follower, which is forced down by screws, and presses the paper, or books, to be cut, and the upper bar serves for the pressing serews to work in.

A sliding bar in front of the press, has in it eight knives, placed a foot apart; they are in form like the ordinary book-binder's cutting knife, and are fixed in the sliding bar in such a way as to admit of their being properly adjusted, and the bar itself is so confined, that whilst it slides freely, it cannot swerve from its proper direction. A fly-wheel and crank, connected to the sliding bar by a reach or pitman, gives to it the proper vibrating motion. The different adjustments we do not attempt to give, as these would require the whole specification. The claim is to 'the simultaneous use of so many knives, brought to bear upon the books or paper to be cut, or trimmed, by turning the balance wheel, and the consequent operation of the weights, shafts, screws, and springs, above described.'

PATENT *for a Metallic Frame Hat Block;* Norris S. Canfield, Wilton, Fairfield county, Connecticut, March 14.

The object of this improvement is to form a hat block which shall admit of a free access of the dying liquor, and of air, in the operation of dying. A cylinder of wood, two or three inches in diameter, and a little longer than the crown of the hat, is to have wire, or strips of copper, or other suitable metal, attached to it in such a way that they may form a round cage, or reel-like apparatus, with the cylinder in the centre. Upon this the hat is to be placed when submitted to the action of the dye-stuff, this operation being performed in the usual way. 'The principle of this improvement consists in the mode of constructing a frame hat block of wire, or strips of copper, or other metal, fixed in the ends of the piece of wood, by the ends thereof, and in sufficient numbers to support the crown in shape.'

On turning to p. 120, it will be seen that Mr. Richard Pike, of Wilton, obtained a patent for a hat block intended to effect the same purpose, and essentially the same in its construction. We are clearly of opinion that one of them interferes with the other.

PATENT *for a Machine to Raise Bags of Grain or Flour, for Shouldering;* John Kinman, Hartley, Union county, Pennsylvania, March 15.

An upright post is to be fixed in the floor, its lower end being rounded, and passing into a socket to allow it to turn round. A sliding box, having a bottom or shelf, upon which to place the bag, and a back and sides to sustain it, slides up and down upon this post, by means of a socket or box, behind that which holds the bag. Upon the post there is a rack, into which a pall, or catch, falls, so as to hold the box at any height to which it is raised. A tackle, or other apparatus, may be used to raise the box and bag to a suitable height for shouldering, when, on removing the catch, the box will again slide down to the bottom of the post.

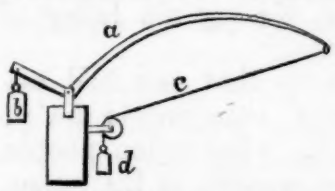
PATENT *f an improved Floating Dry Dock;* invented by John Thomas, of the city of St. Louis, Missouri, and assigned by him to James H. Peck and others, to whom the patent has issued; March 26.

We must give a very brief description of this apparatus, abstracted from upwards of twenty closely written pages

of specification. This floating dock is intended to be passed under a steam-boat or other vessel, by filling the floats of which it is composed, with water, which is then to be pumped out, giving to the dock sufficient buoyancy to raise its load above the water. There may be nine rectangular floats, each sixty feet long, four wide, and four feet six inches deep, their sides being all parallel, and their decks flush; they may be arranged side by side, so as to form a large floating dock. A cradle to sustain the vessel to be raised, is made in separate parts, so as to fix properly on the general deck of the combined floats. Each float is divided into compartments by partitions, for the purpose of giving it the necessary strength, but there is a free communication between these compartments, to allow of the pumping out of the water, when the vessel is to be raised, particular provision being made for this purpose by apparatus specially described; but the limits which we have prescribed to ourselves, prevent our touching these and other parts: 'Which said partitions, decks, chambers, trunks, well, floats, and union of several floats together, to form the dock, are all, and every of them, new and useful improvements on the floating dry dock invented by the said Thomas, for all, and every of which, he solicits a patent, according to the laws of the United States in that behalf made and provided.'

PATENT *for an improvement in the Application of the Lever Power;* Jacob Cochran, South Hadley, Hampshire county, Massachusetts, March 26.

This invention the patentee denominates, 'Cochran's Accumulating Lever,' but if he makes no other discovery to which his name may be attached, and with which it may swim down the stream of time, it will sink at an early part of the voyage. *a*, is the lever, the long end of which, is bent as shown, and to the short end is suspended *b*, the weight to be raised. *c*, is a returning lever, chain or cord, which is to pass over a pulley as shown, and a small weight *d*, attached to it, 'when it will be found that with equal speed and time, a less weight applied to the lower extremity of the return-



ing lever, will raise or put in motion, a greater weight or power applied to the end of the lever first mentioned,' (the short end.)

We do not think it necessary to insert the claim, or to waste a word of reasoning upon the subject of the contrivance.

PATENT *for an improvement in the Gridiron;* Ami Clark, Berlin, Hartford county, Connecticut, March 28.

This gridiron is to be made round, square, or otherwise, and is to revolve upon its centre, like other revolving gridirons. The bars also, are to be fluted, as heretofore, for the purpose of collecting the gravy; but it is to differ from other gridirons much in the same way in which the kangaroo differs from other quadrupeds, namely, in the relative length of its hind and fore legs, in order to give to the gravy the proper disposition to descend into the receptacle prepared for it. Those cooks who have gridirons with legs of equal length, if any such there be, which we very much doubt, will, we hope, consider themselves as still at liberty to prop them on one side, in any degree which they may find convenient; should there be in existence such a thing as a gridiron with fluted bars, a trough for the gravy, and hind legs longer than the fore, such as we remember to have seen in those days when a sop in the pan was accounted a great delicacy, it may continue to stand out of the horizontal, without obtaining a new lease.

THE WORTH OF MAN, OR MAN OF WORTH.

WHEN one man is worth a thousand pounds and another ten thousand, in common language, we say the latter is worth ten times as much as the former.

If this meant no more, than simply that one had ten times as much property as the other, time would be ill spent in cavilling with the expression. But when people estimate the worth of a man by the weight of his purse, the extent of his farm, the number of his servants, or size of his house, without examining either the furniture of his head, or qualities of his heart, measure their bows and deal

out their civilities and honors accordingly, common sense smiles at the delusion, and seems solicitous to correct the error.

Is the man a mere cypher all this time? Does he count nothing of himself? Shall he not be rated so high as the purse or chest, that contains the common standard of his worth? May none of the endowments of nature, or acquirements of art, have the honor of being inventoried with the stock of his farm, his merchandise, or household furniture?

Here is a small mistake, says the world, or its less careless computers; we really left out his mental ware, in making our estimate. How shall we correct the error? What is the average worth of a man, stripped like Job, of his external property?—A hard question truly, and but little thought of.

I should suppose it as easy to find an average size for all the animals appendant to the earth. I know of no way to estimate his value, except by what he is worth to the community, or his friends. By this standard, there would be as great a diversity in the worth of men without property as with.

A Franklin, though pennyless, would rise higher than a ——, possessed of a hundred thousand—the one, a public honor; the other, a private disgrace. Innumerable instances might be penned; but they are under every one's observation.

Wealth is a good thing, connected with a liberal mind. Merit has its value, wherever it is found, but is generally prized lowest by those who value money the highest. To do it some degree of justice, let a moderate price be agreed upon, and set down against a list of the most obvious public and private virtues, and useful acquirements.

This will introduce a new kind of calculation. Men's estates may be inventoried as usual after their decease; but there will be a considerable difference between what they are worth while living, and after they are dead.

Let people, while alive, be ranked according to the sum total of their real, personal, and *mental* property, and while pride justly humbled, took its place in the kitchen, merit would be called to the parlor, and receive its due honor from men of real worth.

MISCELLANY.

MESSRS. EDITORS:—Having had occasion in my business, to 'strike a fire' several times a day, and perceiving in the January number of your work, a receipt for making 'Lucifer Matches,' I was induced to try the experiment, and have tried it several times, but have never been able to produce a spark of fire; so far from it that the sulphate of antimony appears to have the contrary effect, viz. to extinguish the flame. A subscriber to the Mechanic, would thank C. D. or the Editors, to look at that receipt, and see if there is not some mistake, as I am very sure that no fire can be produced from those ingredients, without the addition of some other substance.

Weymouth, October 11th, 1834. Yours, &c. A. A. V.

FIRE PROOF BUILDINGS.—Some time ago, we heard of a proposition to build for a certain sum, fire proof buildings, in a new and efficacious manner. We wish the man and his project, could be brought again to knowledge, that we might, if necessary, recommend him to the patronage of our readers; besides which, we have some curiosity to know the nature of the invention. We have a faint idea of its having been Prof. Ratinesque, we dare not be sure; perhaps some of our cotemporary periodicals can inform us.

INDELIBLE INK.—This ink, it is now well known, has for its prinpal ingredient, nitrate of silver. The corrosive sublimate, a chemical preparation of mercury (*deuto-chloride*) has been found to *destroy* the color produced by it.

WRITING INK.—It is much to be wished, that some chemist would devise a writing ink, which, while it should possess the beauty and freeness of our best black inks, should be absolutely indestructible by any chemical agents, except such as would also destroy the paper on which the writing was made.

MACHINERY IN THE HUMAN FRAME.—Very few, even mechanics, think or know, how much machinery there is in their own bodies. Not only are there joints and hinges, in the bones, but there are valves in the veins, a forcing pump in the heart, and various other curiosi-

ties. One of the muscles of the eye, forms a real pulley. The bones which support the body are made precisely in that form, which has been calculated by mathematicians, to be strongest for pillars and supporting columns:—that of hollow cylinders. This form combines the greatest lightness with the greatest strength. Of this form are the quills in bird's wings, where these requisites are necessary.

Globes.—We hope soon to see globes universally in use in schools; we do not care, even if they banish entirely maps of the world, from which but a very imperfect idea can be got, either of the general configuration of the surface of the earth, or the details of it. Globes are by no means costly, every school in the country is able to procure one, and their great usefulness will more than counterbalance the cost.

Electricity.—This wonderful electric fluid, whose identity with thunder and lightning was ascertained without a possibility of doubt, by the American philosopher, Franklin, is not yet entirely investigated. From ancient time, it was known that the friction of certain substances produced certain phenomena, such as causing light bodies to be alternately repelled and attracted, without any visible cause, which were called *electric*, from the Greek word *elektron*, which means amber, because amber is one of those substances which are thus excited by friction. If a piece of sealing wax be rubbed upon a woollen cloth, as the coat sleeve, it will draw towards it, at short distances, small pieces of paper, which will adhere to it. This is a familiar illustration of what is called electricity, in its most simple form. The splendid discoveries since made, with the electrical machines and galvanic batteries, are well known. Not many years have elapsed, since the power of electricity and magnetism over each other was discovered; there is little or no room for doubt left, that both are effects of one and the same cause, exerted under different circumstances.

But not only friction, as in the electrical machine, or chemical action, as in the galvanic trough, are found to excite electricity, but the mere contact of certain bodies of different natures is found to do it. The rise of fluids in capillary tubes is found to be an electrical effect, and hence we have good reason to believe, that the rise of the sap in trees and plants is an electrical phenomenon.

Air Gun.—It is a curious fact, that although the air pump is a modern invention, yet the air gun, which is so nearly allied to it, in the construction of its valves and condensing syringe, should have

existed long antecedent to it; for it is recorded that an air gun was made for Henry the fourth, by Marin of Liseau, in Normandy, as early as 1408, and another was preserved in the armory at Schmetau, bearing the date of 1474. The air gun of the present day is, however, very different from that which was formerly made, and which discharged but one bullet after a long and tedious process of condensation, while it now discharges five or six without any visible variation of force, and will even act upon a dozen, though with less effect.

Mechanic's Lyceum.—The fifth course of exercises, consisting of Lectures, Debates and Elocution, will commence on Friday evening, Oct. 31st, when an Introductory Lecture will be delivered by Mr. Dunbar B. Harris. The meetings will be continued weekly at Chauncy Hall. Tickets to the course, at one dollar each, may be had at Brigg's Mechanics' Exchange, Claxton & Wightman's, 33 Cornhill, and at Tuttle & Weeks' Printing Office, 8 School Street, where programmes of the Lectures may be seen.

Mechanic Apprentices' Library Association.—The third course of exercises before this Society, commenced on Tuesday evening, Oct. 14th. Lectures will be given on History, Biography, Natural Philosophy, and the Arts. Discussions will also take place at suitable intervals, on various topics of interest. This course, together with a Library of 2000 volumes, and a reading room, is accessible to Mechanic Apprentices for one dollar per year. Library room No. 3 Cornhill, open on Tuesday and Saturday evenings.

QUESTION.

Wanting to know the distance between two trees, on the opposite side of a river from where I am, and having no instrument for measuring angles, only a chain or measuring tape, for measuring lines, without any other instrument or data, required the distance between the trees.